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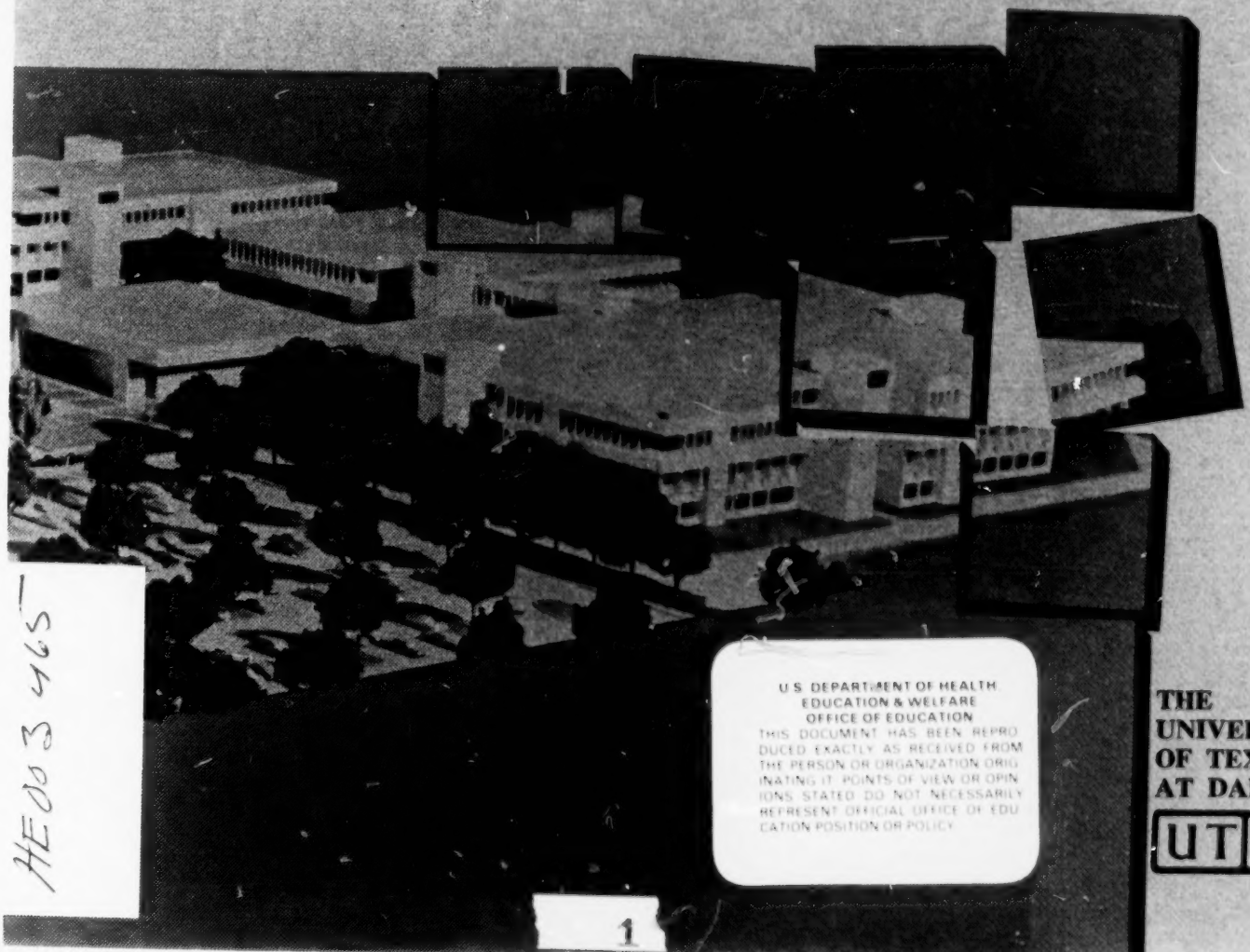
ABSTRACT

This document presents a summary of the academic plan of The University of Texas at Dallas, a recently established upper level university (institution offering only junior, senior and graduate level programs). The document describes the academic organization of the University, the undergraduate programs, the graduate programs, the research policy and programs, and the administrative organization of the University. See also HE 003 464. (HS)

ED 068024

PRECIS

OF THE ACADEMIC PLAN



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THE UNIVERSITY OF TEXAS AT DALLAS

UTD

HE003465

ED 068024

Precis of Academic Plan

(Including request for approval of administrative structure of the Academic Programs, certain Graduate Programs, and of 1975 Undergraduate Offerings)

THE UNIVERSITY OF TEXAS AT DALLAS

The University of Texas at Dallas was established in 1969 by an Act of the Regular Session of the 61st Texas Legislature. In that Act, authority is given to the Board of Regents of The University of Texas System to prescribe courses leading to degrees at the baccalaureate, master's, and doctoral levels. The Act also provides for enrollment of junior and senior undergraduates in September, 1975; for continuation of the graduate programs in existence on September 1, 1969; and for planned expansion of the scope of graduate offerings with the approval of the Board of Regents and the Coordinating Board.

Pursuant to this legislation, an academic plan has been developed for The University of Texas at Dallas. The plan is designed to carry out the wishes of the Legislature and also to afford innovative approaches to the basic task of providing a meaningful educational experience to students.

ACADEMIC PROGRAM STRUCTURE

As planned, The University of Texas at Dallas will be a university with several unique qualities. These qualities will stem from an organization of people, facilities, and curricula which will provide for:

1. Disciplinary integrity within an interdisciplinary context.
2. The establishment of meaningful relationships between the student's specific curriculum and the entire world of work and ideas.

The Lloyd V. Berkner Science Teaching Building (Construction now underway at UT-Dallas).

3. A reduction in the scale of the undergraduate program, as it relates to the individual student, so that personalization occurs in a process which has in too many cases undergone severe depersonalization.[1]

The Faculties

At the heart of the academic program structure of The University of Texas at Dallas will be the *faculties*.[2] As used here, the term *faculty* denotes the body of teachers and researchers who belong to a particular discipline, for instance the biology *faculty*.[3] A *faculty* will ordinarily organize itself, designate a *chairman*, and serve as the voice of its discipline on the campus. It will not comprise a department, since there are to be no departments within the University. It will not be a budget or administrative unit, nor will its *chairman* have budgetary or administrative functions. The *chairman* will be the convener of his *faculty*, and the spokesman for it. He will serve without extra compensation or reduction of teaching load.

The Library Building. A Student Center will be located in the basement area, and upper floors will provide temporary housing for administrative offices beginning in 1975.

Beyond fulfilling their teaching responsibilities, *faculties* will make other contributions to the life of the University — in curriculum planning, recommendations for faculty appointments, and advising the administration on all aspects of the *faculty's* discipline.

The Undergraduate Programs

Faculties will be drawn upon in order to provide both graduate and undergraduate offerings. The overall undergraduate program of the University will be based on the achievement of four goals:

1. Avoiding the negative aspects of mass education.
2. Insuring wholeness of learning.
3. Providing intellectual community.
4. Insuring solid grounding of the student in the basic disciplines of his curriculum.

In furtherance of these goals, it is planned that the undergraduate student at The University of Texas at Dallas will find his place as a member of a particular *college*.[4] The *college* will be the student's intellectual home on the campus. It will provide academic advisement, personal student services such as psychological and vocational counseling, and the base for most co- and extra-curricular activities. It will also provide the required interdisciplinary seminar which is planned as the capstone of all undergraduate degree programs. In short, it will guide the student through his undergraduate career, to his degree.

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[1] These and other important principles will be illustrated through references to Figure 1, a graphic representation of the proposed overall academic program at UT Dallas, and Figure 2, a diagram of the proposed academic organization of the University.

[2] Throughout this document, the italicizing of a term indicates that the term is used in a way that is peculiar to the academic plan of the University. Each such term is defined the first time it is used.

[3] Note the designation of the various disciplines, and thus the various *faculties*, in the center of Figure 1.

[4] It is expected that eight undergraduate *colleges* will be required in 1975. These are designated along the left-hand side of the lower part of Figure 1.

A *college* will be related to a particular disciplinary grouping (natural sciences, management and administrative sciences, social and behavioral sciences, or humanities and the arts).[5] A student will thus be assigned to one of the *colleges* related to the discipline or disciplinary group in which he is majoring.[6]

A *master* will head each college, serving as the chief administrative, academic and budget officer. It will be his responsibility to see that the educational aims of his *college* are met.

Each *college* will have a small (10 to 15 member) *college faculty* associated with it. The *college faculty* will assist the *master* in implementing the programs aimed at fulfilling the personal and educational goals of the students in the *college*. The principal teaching duty of the *college faculty* will be to offer a four-semester interdisciplinary seminar intended to relate the student's major to the entire world of work and ideas.[7]

A student will take his interdisciplinary seminar within his own *college* and from his *college faculty*, but will have many of his other courses from teachers other than his *college faculty*. In this connection, it should be noted that only about 80 to 100 of a 1975 faculty of 200 will be a part of a *college faculty*.

Each member of a *college faculty* will be expected, beyond his responsibility in the interdisciplinary seminar, to be heavily involved with academic advising, and to participate in the co- and extra-curricular life of the *college* with which he is associated. Beyond his responsibility in his *college*, he is expected to teach in his own discipline on a University-wide basis.

The Graduate Programs

The University of Texas at Dallas has the opportunity, quite rare in higher education, of building from the top down; that is, the institution is starting with graduate and post-doctoral education. This permits the building of especially strong nuclei for each *faculty* as the graduate offerings develop in new areas.

The organization of the *graduate programs* will reflect programmatic function rather than academic departmentalization. The *graduate programs*[8] of the University will be the administrative and budgetary units which offer the graduate teaching and degrees. They may be interdisciplinary in nature, (for example, environmental sciences) or they may lie primarily within one discipline (for example, physics). Teachers will be drawn from one or more *faculties* for the various *graduate programs*.[9] *Heads* of *graduate programs*[10] will be responsible for the academic, administrative, and fiscal aspects of *graduate programs*. These administrators will thus have the primary duty of seeing that their *graduate programs* attract good candidates, provide superior teaching, and produce graduates worthy of the institution.

Research

There has existed since the establishment of the Southwest Center for Advanced Studies, the predecessor of The University of Texas at Dallas, a distinguished and well recognized program of research. The nature of this research has ranged widely, from the instrumentation of lunar exploration hardware to problems in the bio-chemical repair of animal cells. It is planned that these activities will continue, provided that outside funding continues. So far, levels of such funding have remained high at The University of Texas at Dallas, despite the general decrease in research funds the country over.

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[5] Though Figure 1 shows two *colleges* related to each of the disciplinary groupings, the ultimate distribution of the *colleges* is problematical. A precise determination must await knowledge of the curricular demands of the undergraduate student body.

[6] The University's proposed undergraduate majors, together with the specific degree designations, are shown in the lower part of Figure 1 as related to particular *colleges*. Students seeking a bachelor's degree in English would, thus, enroll in either *College* VII or *College* VIII.

[7] These seminars are outlined in heavy rectangles within the section of Figure 1 depicting the disciplines and the *faculties*.

[8] These are shown in the left-hand rectangles of the upper portion of Figure 1.

[9] See the output lines and dots in the upper portion of Figure 1.

[10] See Figure 2.

In continuing this work, the University will utilize a group of *institutes* within the Center for Advanced Studies as the managerial units for research activities.[11] *Directors* of *institutes* report to the *Executive Director of the Center for Advanced Studies*. Each *director* is a member of a *faculty*, and each will be expected to correlate the research programs under his direction with appropriate *graduate programs* and undergraduate activities. Members of the *faculties* will be principal investigators in the *institutes*.

Summary of the Academic Program Structure

The rationale and meaning of the academic program structure as depicted in Figure 1 may be characterized as follows. The *faculties* of the University will furnish intellectual and human resources appropriate to the needs of the University, whether it is as teachers of undergraduate courses[12], as members of the *college faculties* providing academic advertisment and the required undergraduate interdisciplinary seminars[13], as teachers of graduate courses in *graduate programs*[14], or in all three capacities. Where research funding is available, a *faculty* member might also spend part of his time as a member of one of the research *institutes* within the Center for Advanced Studies.[15] A member of a *faculty* will thus be "hired" for a proportionate amount of his time by one or more of the following: the *head* of a *graduate program*; the *master of a college* (for service as a member of the *college faculty*); the *Executive Dean for Undergraduate Studies* (for the teaching of undergraduate courses other than the required interdisciplinary seminar); or the *director* of one of the *institutes*. This concept is clearly in contrast to the traditional one whereby a faculty member owes his primary allegiance to a particular discipline and department, operating under a department chairman or head.

ADMINISTRATIVE ORGANIZATION

Organization for academic administration at the University is planned to provide administrative leadership for implementation of a unique academic program structure[16]. The organization will be centered around a *Provost and Dean of Faculties* who is the chief academic officer of the University. He also acts for the President when called upon to do so. Assisting the *Provost* will be the other principal academic officers named below.

The *Executive Director of the Center for Advanced Studies* will have purview over the *institutes* in the University and thus will be in general charge of sponsored research. As a member of the President's staff, he will serve as an advisor to the *Provost* and the President on matters related to sponsored research.

The *Executive Director of Academic Services* will direct the instructional support, library, registration, and admissions activities of the University. It will be his responsibility to insure that the University's academic service functions are available and effective. It is contemplated that he will provide special training in college teaching procedures for young and inexperienced faculty members. As a member of the President's staff he will advise the *Provost* and President on the activities within his purview.

The *Executive Dean of Graduate Studies* will direct the University's effort in graduate education. He will be responsible to the *Provost* and the President for the quality of graduate teaching programs and, with the advice of the *faculties*, for the standards of admission and graduation in the *graduate programs*. He will be a member of the President's staff.

The *Executive Dean of Undergraduate Studies* will be responsible for the work of the

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[11] See Figure 2.

[12] Shown in output lines leading to degree designations (B.S. or B.A.) in the lower portion of Figure 1.

[13] Shown in output lines and dots leading from the heavily outlined rectangles among the disciplines in Figure 1.

[14] Shown in output lines and dots leading from the disciplines to the *graduate program* lines in Figure 1.

[15] See Figure 2.

[16] The complete organization for the administration of academic programs is depicted in Figure 2.

colleges and for all undergraduate academic activity. It will be his job to maintain the quality of undergraduate life at the University, and to see that the undergraduate programs, in the *colleges* and in the entire University, are of excellent quality. He will be a member of the President's staff.

UNDERGRADUATE DEGREE OFFERINGS

Through the implementation of the innovative academic arrangement spelled out in the preceding sections, and keeping in mind the four goals set out on Page 2, The University of Texas at Dallas proposes that the following undergraduate degree offerings be available at the beginning of the 1975 academic year:

Bachelor of Arts:

- Anthropology
- Economics and Finance[17]
- English
- French
- Geography
- German
- History
- Political Science
- Psychology
- Russian
- Sociology
- Spanish

The Liberal Arts Building, Lecture Hall-Theatre, and Social-Behaviorial Sciences Building, to be placed at the north along the Academic Mall.

Bachelor of Science:

- Biology
- Business and Public Administration
- Chemistry
- Dietetics and Nutrition
- Economics and Finance[17]
- Educational Media
- Geological Sciences
- Mathematical Sciences[18]
- Occupational Therapy
- Physics
- Special Education
- Speech Pathology and Audiology

In addition to the foregoing list of undergraduate degrees proposed for initiation upon admitting undergraduates in 1975, The University of Texas at Dallas will be planning toward offering in 1977 the additional Bachelor of Arts degrees set forth below. None of these programs will be offered without prior approval by the Board of Regents and the Coordinating Board.

- Art
- Music
- Philosophy
- Theatre

[17] Either a B.A. or B.S. degree may be earned in this discipline.

[18] With emphasis in either mathematics, computer science, or statistics.

GRADUATE DEGREE PROGRAMS

The history of the present graduate programs at The University of Texas at Dallas is short but distinguished. As a result of research and study at the University and at its predecessor, the Southwest Center for Advanced Studies, one or more Ph.D. or Master's degrees in physics, mathematics, geosciences, and biology have been awarded at Oklahoma State University, The University of Texas at Austin, The University of Brussels, Southern Methodist University, North Texas State University, Emory University, The University of Brazil, Texas A&M University, The University of Cologne, Tokyo Metropolitan University, the University of London, the Federal University of Rio de Janeiro, and the University of Witwatersrand in South Africa.

Present Graduate Programs

All course work and research activity for the Master of Science, Master of Arts, and Doctor of Philosophy degrees in Physics, Geological Science and Biology are presently offered by The University of Texas at Dallas. Temporarily, with the approval of the Southern Association of Colleges and Schools, these degrees are awarded by The University of Texas at Austin. Upon accreditation by the Southern Association as a free-standing institution, The University of Texas at Dallas will award these degrees.

New Graduate Programs

In expanding the scope of graduate offerings as provided in the 1969 Act of the Texas Legislature, The University of Texas at Dallas has no intention of replicating graduate offerings which exist in major institutions simply to produce a standard set of degree curricula. Instead, consistent with constraints imposed by the need for high quality faculty in certain basic disciplines, the University will expand graduate offerings only into those areas where a need can be shown locally, regionally or nationally. As an example, there is a demonstrable need for an interdisciplinary program aimed at providing trained personnel for industry and government in the field of environmental sciences. Such a program will involve intensive work in at least two of the natural sciences, as well as considerable work in such fields as management and social science. Further, as can be seen by the innovative academic arrangement set out above, the University will avoid self-perpetuating departmental curricula in which Ph.D.'s are trained to train Ph.D.'s, to train more Ph.D.'s.

Pursuant to a rational plan of development, and considering the present University of Texas at Dallas programs as well as the needs of the North Central Texas area, it is proposed that the following graduate degree offerings be approved, and that implementation take place as funding becomes available:

Master of Science:

- Chemistry
- Environmental Sciences
- Mathematical Sciences[19]
- Management and Administrative Sciences[20]

[19]As planned for The University of Texas at Dallas, the *graduate program* in mathematical sciences proposes advanced work in applied mathematics, mathematical theory, computer sciences, and statistics. A student will be expected to take work in all four areas of the mathematical sciences, and also to specialize in one. In some cases, student programs under this major will be designed specifically to train junior college teachers.

[20]The *graduate programs* in management and administrative sciences are proposed so as to provide for sub-specialties in the following areas: information science and data management, management in education, management and administration, management of financial institutions, management for the delivery of health services, the planning of management systems, and management for transportation. The management systems *faculty* will provide specialties in these particular sub-specialties.

Master of Arts in Teaching:
Mathematical Sciences[21]
Doctor of Science:
Environmental Sciences

In addition to the foregoing *graduate* degree *programs* recommended for immediate approval, other *graduate* degree *programs* being planned for The University of Texas at Dallas include those listed below. These *programs* will not be implemented without prior approval of the Board of Regents and the Coordinating Board.

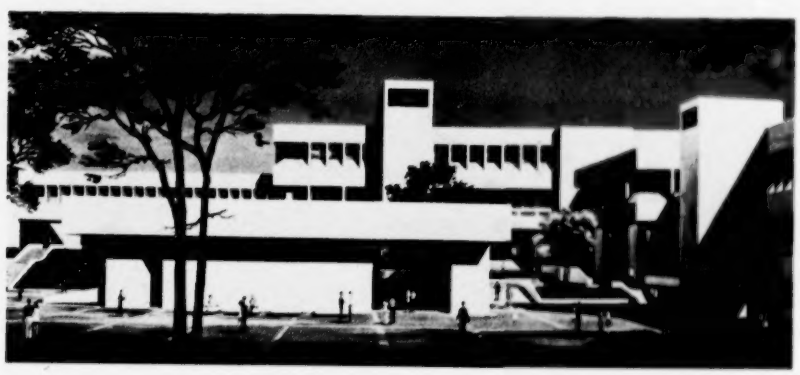
American Studies (M.A. and Ph.D.)
Humanities (M.A., M.A.T., and Ph.D.) (preparation of junior college teachers)
Industrial Biosciences (M.S. and Ph.D.)
International Studies (M.S. and Ph.D.)
Management and Administrative Sciences (Ph.D.)
Mathematical Sciences (Ph.D.)[22]
Pharmacy (D. Pharm.)
Social Sciences (M.A., M.A.T., and Ph.D.) (preparation of junior college teachers)

SUMMARY AND REQUEST

The purpose of this document is threefold:

1. To summarize the plan for the development of the academic program of The University of Texas at Dallas, including the present graduate offerings, *graduate programs* planned for the future, and undergraduate programs planned for implementation in 1975 and 1977.
2. To request approval of the proposed 1975 undergraduate offerings (listed on p. 5) and the new *graduate programs* being proposed for implementation upon the availability of funding (listed on pp. 6-7).
3. To request approval of the plan for the structure and administration of the academic programs of the University (illustrated in Figures 1 and 2).

Approval is hereby requested for the requests summarized in items 2 and 3 immediately above.



The Liberal Arts Building and Lecture Hall-Theatre, extending from Founders North annex along the Academic Mall.

[21]See Footnote 19 supra.
[22]See Footnote 19 supra.

Footnotes for Figure 1

1. These are *programs* designed to train teachers for junior colleges. Though these curricula are interdisciplinary in format, degree recipients will be required to do in-depth study and research in one of the social sciences or humanities.
2. Parentheses enclosing dots in *graduate programs* indicate optional inputs.
3. Like the American studies *program*, the international studies *program* will allow The University of Texas at Dallas to acquire a higher quality of undergraduate teacher by affording a limited amount of graduate activity for that teacher. For instance, the Ph.D. *program* in international studies will afford the chance for various members of the *faculties* in the areas of social and behavioral science and humanities and the arts to teach a limited amount of graduate work. This is highly desirable in affording continuing research and study activity for the undergraduate teacher.
4. The *graduate programs* in management and administrative sciences are proposed so as to provide for sub-specialties in the following areas: information science and data management, management in education, management and administration, management of financial institutions, management for the delivery of health services, the planning of management systems, and management for transportation.
5. As planned for The University of Texas at Dallas, the *graduate program* in mathematical sciences proposes advanced work in applied mathematics, mathematical theory, computer sciences, and statistics. A student will be expected to take work in all four areas of the mathematical sciences, and also to specialize in one.
6. In some cases, student programs under this major will be designed specifically to train junior college teachers.
7. In either Dietetics and Nutrition, Occupational Therapy, or Speech Pathology and Audiology.
8. The management systems *faculty* will provide specialists in the particular sub-specialties, within the general field of management and administrative sciences, which are outlined in Footnote 4.
9. The undergraduate programs in economics and finance will offer both the bachelor of science and the bachelor of arts degrees. For those students who are inclined toward the field of finance and applied economics, the bachelor of science degree will be the usual goal. For the student who is more interested in the historical and theoretical aspects of economics the bachelor of arts degree will be more appropriate.
10. At the undergraduate level, the bachelor of science degree is proposed in the general field of business and public administration.
11. Only in the fields of special education and educational media.
12. The input dots in parentheses indicate that students receiving the bachelor of science and bachelor of arts degrees in the various undergraduate disciplines will be able to acquire certification to teach in the secondary schools of Texas.
13. In English only.
14. In French, Spanish, German, and Russian.
15. In either history or philosophy (1977).
16. The bachelor of arts (non-professional) degree is proposed in the fields of music (1977), art (1977), and theatre (1977).

Figure 1

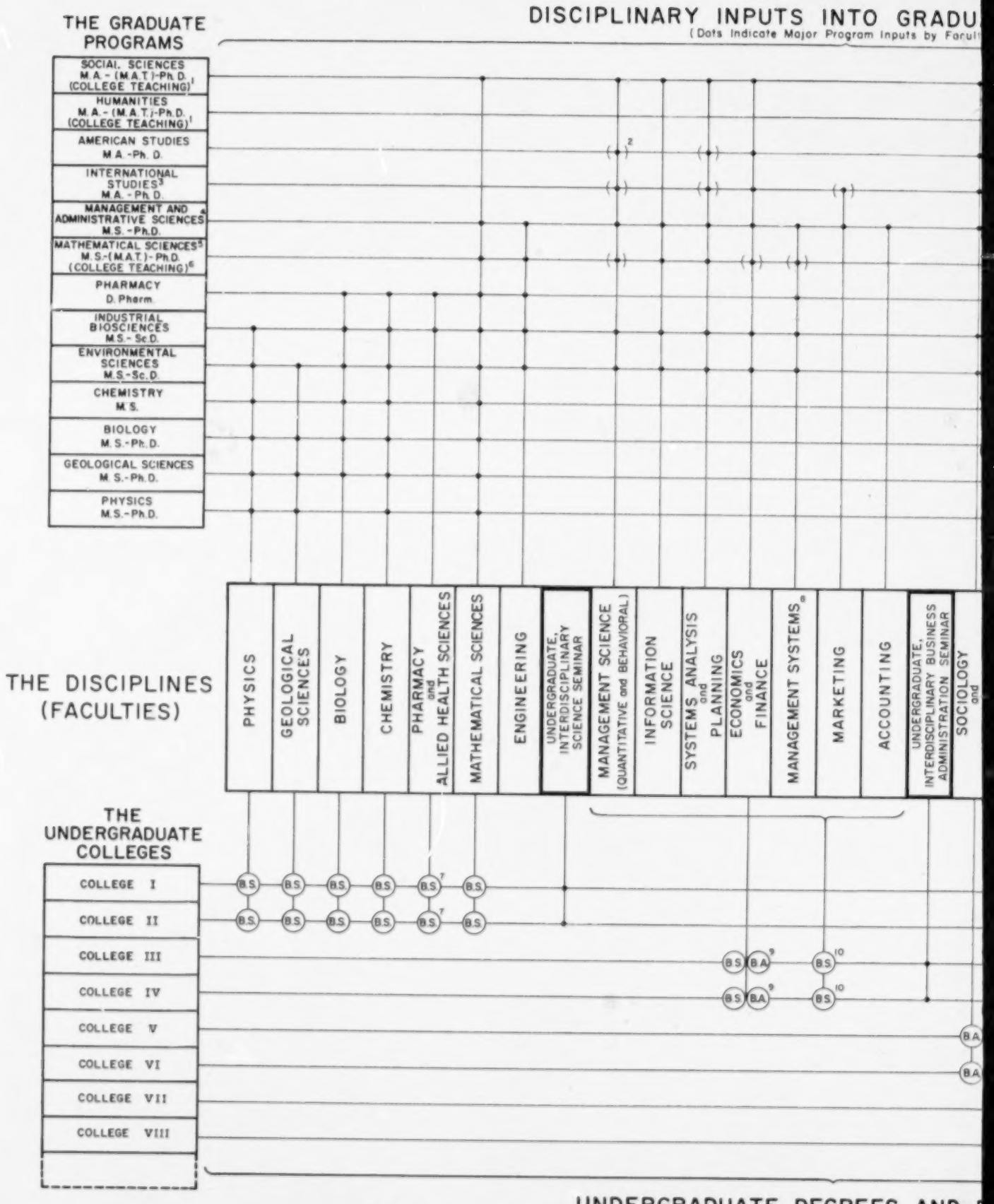
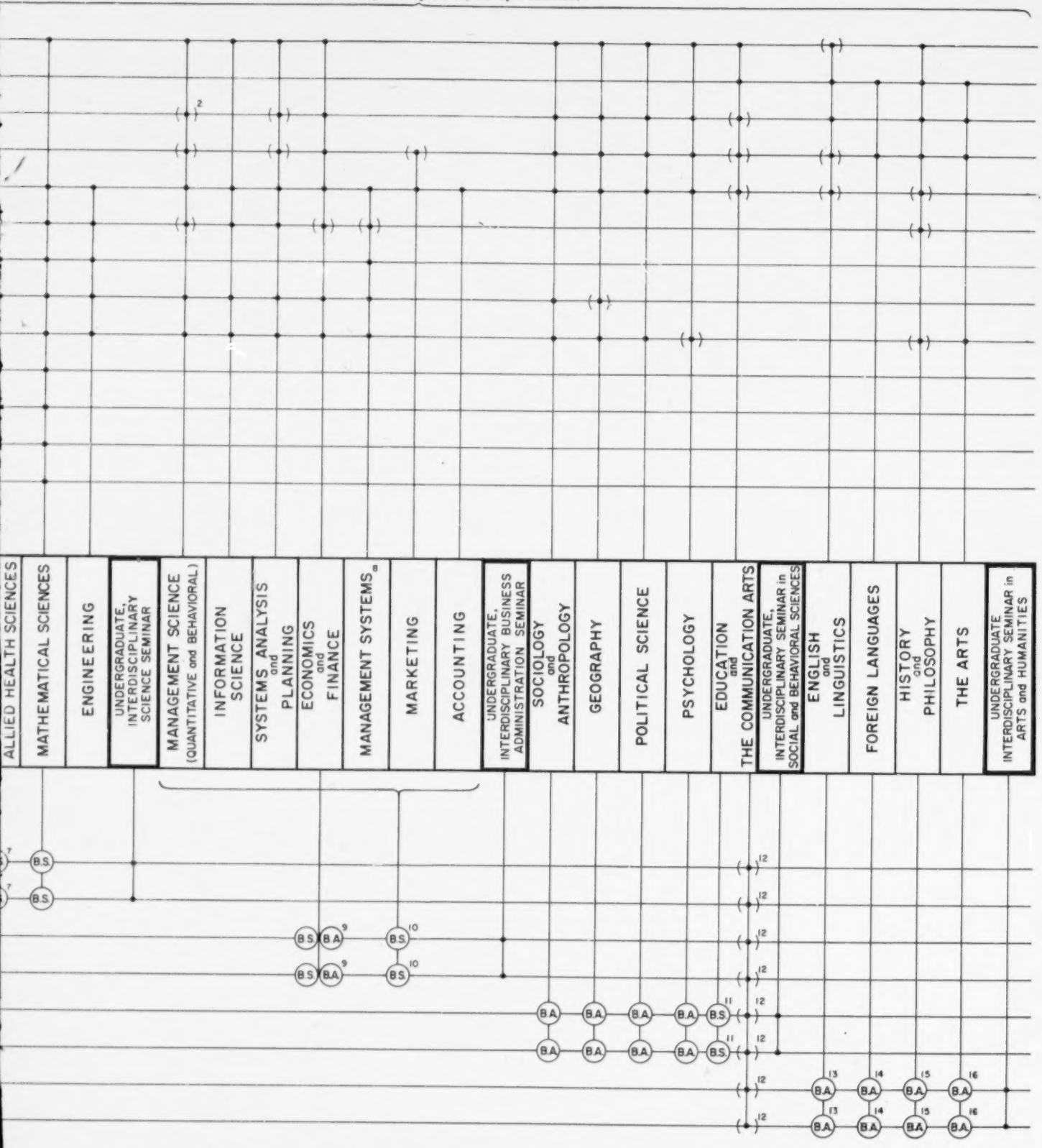

DISCIPLINARY INPUTS INTO GRADU
(Dots Indicate Major Program Inputs by Faculty)
THE GRADUATE PROGRAMS
SOCIAL SCIENCES M.A. - (M.A.T.)-Ph.D. (COLLEGE TEACHING)[1]
HUMANITIES M.A. - (M.A.T.)-Ph.D. (COLLEGE TEACHING)[1]
AMERICAN STUDIES M.A.-Ph.D.
INTERNATIONAL STUDIES[3] M.A. - Ph.D.
MANAGEMENT AND ADMINISTRATIVE SCIENCES[4] M.S. - Ph.D.
MATHEMATICAL SCIENCES[5] M.S.-(M.A.T.)-Ph.D. (COLLEGE TEACHING)[6]
PHARMACY D. Pharm.
INDUSTRIAL BIOSCIENCES M.S. - Sc.D.
ENVIRONMENTAL SCIENCES M.S.-Sc.D.
CHEMISTRY M.S.
BIOLOGY M.S.-Ph.D.
GEOLOGICAL SCIENCES M.S.-Ph.D.
PHYSICS M.S.-Ph.D.
THE DISCIPLINES (FACULTIES)
PHYSICS
GEOLOGICAL SCIENCES
BIOLOGY
CHEMISTRY
PHARMACY and ALLIED HEALTH SCIENCES
MATHEMATICAL SCIENCES
ENGINEERING
UNDERGRADUATE, INTERDISCIPLINARY SCIENCE SEMINAR
MANAGEMENT SCIENCE (QUANTITATIVE and BEHAVIORAL)
INFORMATION SCIENCE
SYSTEMS ANALYSIS and PLANNING
ECONOMICS and FINANCE
MANAGEMENT SYSTEMS[8]
MARKETING
ACCOUNTING
UNDERGRADUATE, INTERDISCIPLINARY BUSINESS ADMINISTRATION SEMINAR
SOCIOLOGY and
THE UNDERGRADUATE COLLEGES
COLLEGE I
COLLEGE II
COLLEGE III
COLLEGE IV
COLLEGE V
COLLEGE VI
COLLEGE VII
COLLEGE VIII
B.S.
B.A.
UNDERGRADUATE DEGREES AND
(Circles Indicate Undergraduate Degrees)

Figure 1

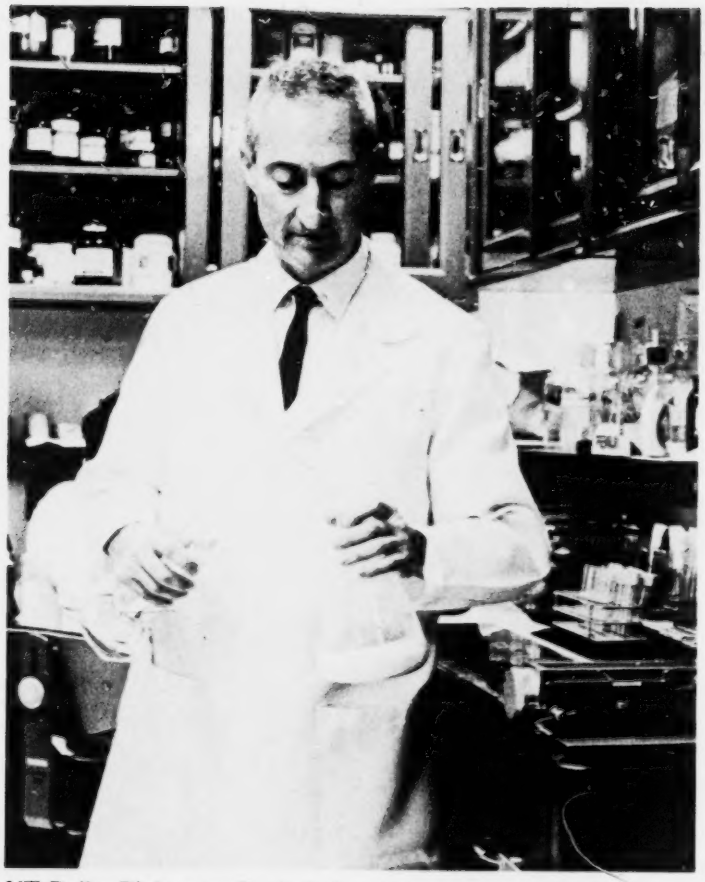
DISCIPLINARY INPUTS INTO GRADUATE PROGRAMS

(Dots Indicate Major Program Inputs by Faculties)

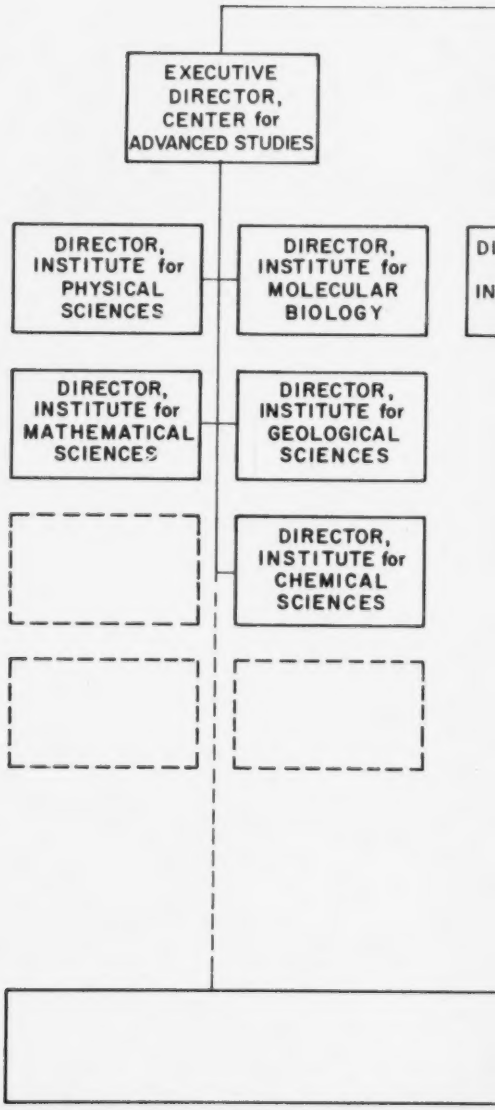


UNDERGRADUATE DEGREES AND PROGRAMS

(Circles Indicate Undergraduate Degrees)



UT-Dallas Biology studies include a strong interest-center in natural repair processes following radiation damage.


EXECUTIVE DIRECTOR, CENTER for ADVANCED STUDIES
DIRECTOR, INSTITUTE for PHYSICAL SCIENCES
DIRECTOR, INSTITUTE for MOLECULAR BIOLOGY
DIRECTOR, INSTITUTE for MATHEMATICAL SCIENCES
DIRECTOR, INSTITUTE for GEOLOGICAL SCIENCES
DIRECTOR, INSTITUTE for CHEMICAL SCIENCES

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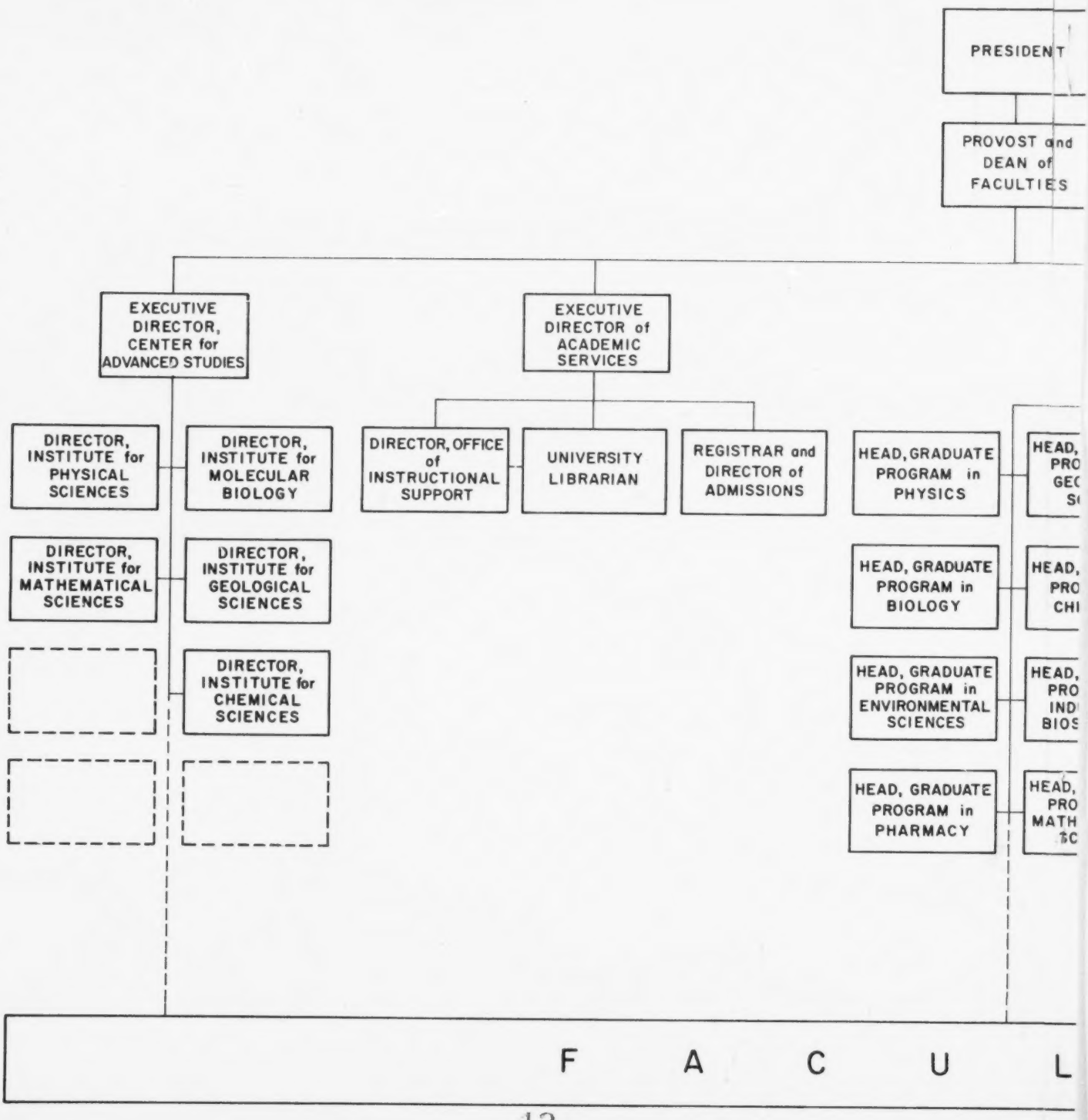
PRESIDENT
PROVOST and DEAN of FACULTIES
EXECUTIVE DIRECTOR, CENTER for ADVANCED STUDIES
EXECUTIVE DIRECTOR of ACADEMIC SERVICES
DIRECTOR, INSTITUTE for PHYSICAL SCIENCES
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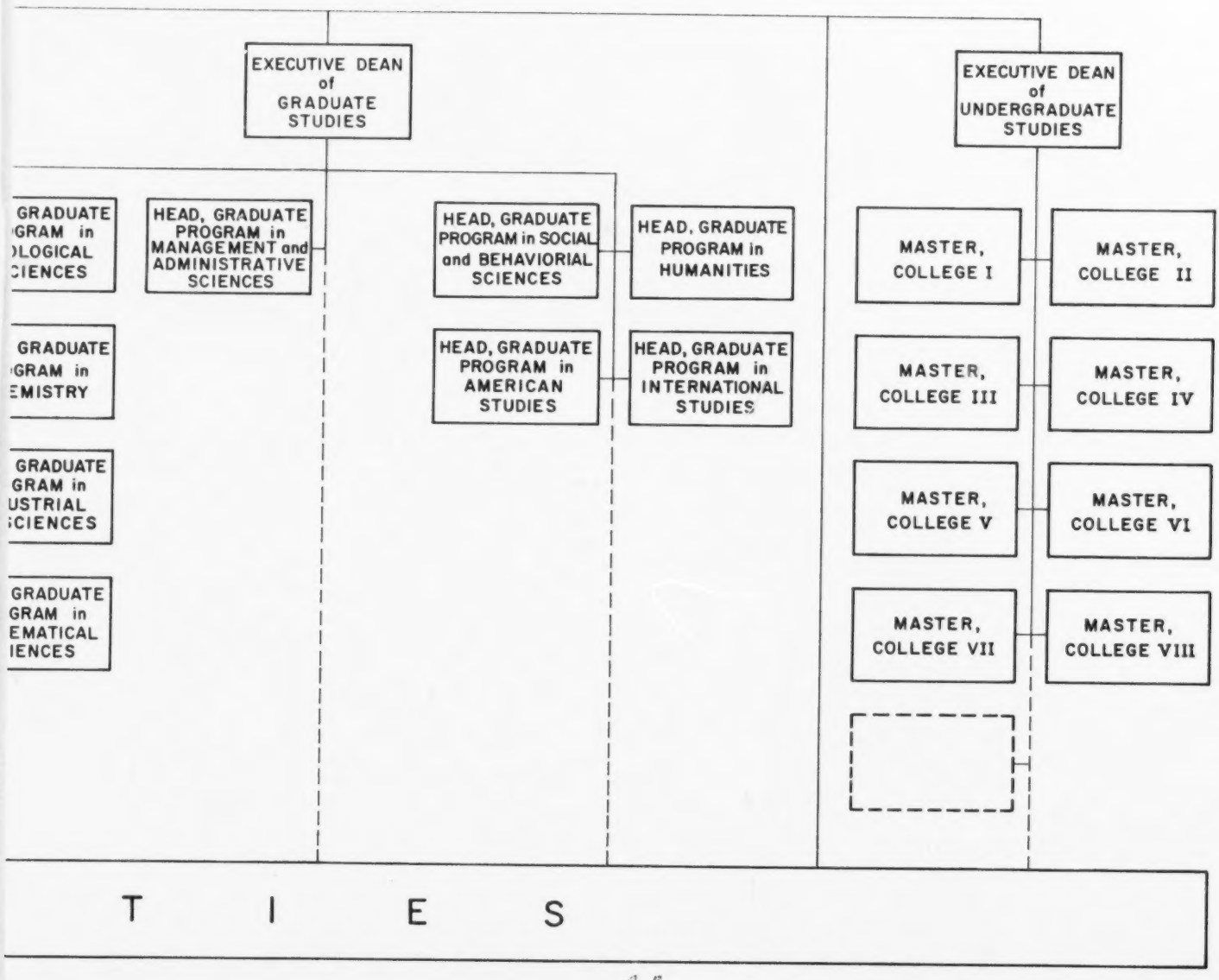
HEAD, GRADUATE PROGRAM in PHYSICS
HEAD, GRADUATE PROGRAM in BIOLOGY
HEAD, GRADUATE PROGRAM in ENVIRONMENTAL SCIENCES
HEAD, GRADUATE PROGRAM in PHARMACY
F A C U L

Figure 2

CADEMIC PROGRAMS
XAS AT DALLAS


EXECUTIVE DEAN of GRADUATE STUDIES
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MASTER, COLLEGE V
MASTER, COLLEGE VI
MASTER, COLLEGE VII
MASTER, COLLEGE VIII
T I E S

A Mass Spectrometer designed and fabricated at UT-Dallas was orbited in the lunar atmosphere on a boom extending from the Command/ Service Module of Apollo 15, to provide a wealth of information for graduate study.

This is an astronaut's photograph of one of the UT-Dallas Lunar Atmosphere Detectors in place on the Moon. There are two such instruments in operation. (NASA official photo).

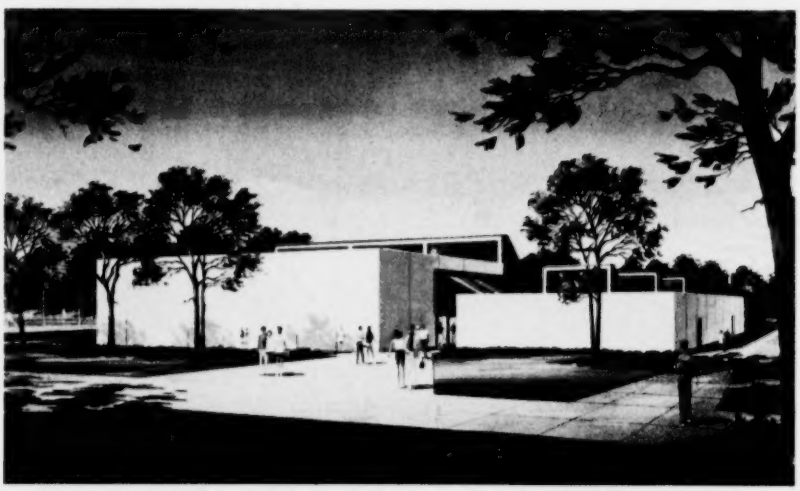
Addendum

Brief explanations of new Graduate Programs being proposed for implementation upon the availability of funding

Because the four new *graduate* degree *programs* (Chemistry, M.S.; Environmental Sciences, M.S. and Sc.D.; Mathematical Sciences, M.S. and M.A.T.; Management and Administrative Sciences, M.S.) being proposed for The University of Texas at Dallas are, with one exception, non-traditional in nature, it is felt that brief explanations of these programs should be appended to the Precis. These explanations follow.

CHEMISTRY (M.S.)

Many problems of urgent social importance require strong input from the discipline of chemistry: air and water pollution and the improvement of the environment; control of disease; problems relating to the world's food supply. There exist many problems of less urgency, but of no less ultimate importance, the solution for which must be sought through chemistry: the understanding of the complex chemistry which is the basis of life processes;



The Physical Instruction Building, offering a center for lifetime sports such as handball, squash and tennis; the area plan includes 10 lighted tennis courts.

improvements in the many chemical products and processes so basic to our modern society, and the development of new ones; enhanced understanding of chemical structure and the chemical bond; the dynamics of chemical processes, so that new materials (semiconductors, pharmaceuticals, catalysts, and others) may be systematically sought; and, the enhancement of efficiency and understanding of chemical synthesis to prepare such materials. All of these possibilities point to the need at The University of Texas at Dallas for a master's level chemistry *program*. Such a *program* will support the present programs in physics, geological sciences and molecular biology; and it will be an essential element in the proposed *program* in environmental sciences.

These potential contributions help to define some of the needs for education in chemistry today. Chemists are needed who are highly trained and who are skilled in addressing and solving problems. Both chemists who pursue "inward-looking" basic chemistry and "outward-looking" chemistry applied to, or applied in conjunction with, other disciplines will be needed. The Master of Science *program* in chemistry is designed as a response to these needs.

The M.S. *program* in chemistry we propose is rigorous and intensive, yet broad in scope. Twenty-seven hours of required coursework, plus an additional twelve hours of thesis work, place our requirements at the upper limit of those for the M.S. degree at other institutions; we believe this added strength will provide our graduates an advantage as they seek jobs. The requirement of a thesis will insure that our degree holders have developed a critical appreciation of an area of chemistry and have shown the ability to attack and solve a problem of modest scope.

We propose two complementary methods of training broader and more "outward-looking" chemists. One is a minor in another science, for example in the strong teaching and research programs presently in existence at The University of Texas at Dallas in molecular biology, geosciences, and physics, and in the *programs* which are planned in environmental sciences and management sciences. Another method is the research training course, which provides the student a chance to see the methodology of problem-solving in an area outside his thesis area.

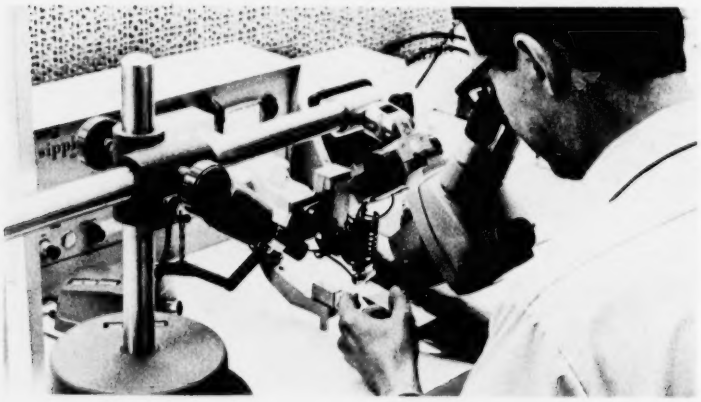
A graduate of this *program* may be employed in industry, in junior college teaching, and in clinical laboratories. He may continue his scientific training at the University of Texas at Dallas or elsewhere in chemistry or other fields as his specific course pattern provides. We anticipate, for example, that this *program* will provide significant numbers of students for the environmental sciences ScD. *program* at UT Dallas.

ENVIRONMENTAL SCIENCES (M.S., Sc.D.)

The purpose of the new *program* in environmental sciences is the training of a new professional to study, analyze, assess, and provide solutions for a broad range of environmental problems. This proposal is a part of the basic thrust of the University in

graduate education — to provide degree *programs* which aim at the solution of some of the country's basic problems. Such a thrust, we think, will best serve the North Central Texas area and, concomitantly, assure employment for those receiving graduate degrees from The University of Texas at Dallas.

The *program* will bring into cooperative interaction a wide range of disciplines in the basic, applied, and management sciences. In its new publication on environmental science, the National Science Board suggests such a disciplinary spectrum when it defines the field as ". . . the study of natural processes, their interactions with each other and with man, and which together form the earth systems of air, land, water, energy, and life." The



Precise fabrication is required for remote-sensing instruments.

Board also notes that it is "The environment within which man can look to a constructive future." The conclusion is then reached that "It is thus of the greatest importance that research in the social and managerial sciences can be coupled with that in the natural sciences to the end that knowledge and understanding will be used effectively and wisely."*

In general, a student will earn a master's degree either in an existing discipline, or in an area involving two or three disciplines in the natural sciences, in order to insure sufficient depth within a particular area of science. He will also take courses in areas peripheral to his specialty, in order to insure the breadth necessary to work on multidisciplinary problems. The degree, Doctor of Science, will be awarded to students who have successfully completed the course work and participated in an intensive multidisciplinary laboratory or field oriented research and problem-solving project, using university or other facilities.

The *program* itself will involve three general areas, the primary focus of which is the urban and peri-urban environment: 1) physical, chemical and biological processes in the environment (oriented towards the fundamental natural science of the environment); 2) human ecology (emphasizing research and control of health problems associated with the environment, as well as the psychological, social, and cultural perception of the environment); 3) environmental management (encompassing the relation of engineering design, decision

**Environmental Science: Challenge for the Seventies.* Washington, D.C.: The National Science Board, 1971, p. 2.

making, and the management of natural resources). Because of the present capabilities at The University of Texas at Dallas in the natural sciences, the initial phase of this *program* will focus primarily on the first of the three areas.

This approach allows the University to embark on a program of manageable proportion, while also providing the means to expand. We anticipate that this *program* will appeal not only to persons just completing their undergraduate training, but also to those having degrees in disciplines for which the number of jobs is now much less than the number trained for them. By concentrating initially on the Master's degree student oriented towards problem-solving, we hope to gain an increasingly accurate understanding of the kind of training needed for jobs in industry and government, as well as the rate at which such jobs will become available.

This *program* has resulted from the deliberation of a University of Texas at Dallas Ad Hoc Committee on a *program* in Environmental sciences, with the advice of: Dr. Abel Wolman (The Johns Hopkins University), Dr. Stephen Gage (White House Fellow associated with the Office of Science and Technology), Mr. Henry Graeser and Dr. Harold Wolf (Dallas Water and Sewage Department), Dr. Peter Flawn (Vice President for Academic Affairs, The University of Texas at Austin), and Dr. John Chapman (Southwestern Medical School).

MANAGEMENT AND ADMINISTRATIVE SCIENCES (M.S.)

The small number of outstanding graduate programs in management and administration in the United States today is dichotomous. At the one extreme are programs in management science* which are so mathematically sophisticated that their products display the characteristics of mathematicians who prefer to generate theoretical solutions to hypothetical questions rather than to use relevant mathematics to facilitate the solution of realistic management and administrative problems. Programs of this nature usually provide the student with a very limited understanding of the concepts of both the behavioral aspects of management and administration and basic business concepts.

At the other extreme, the more nearly traditional high quality management programs** have a tendency to emphasize through the case approach the aspects of managerial decision making which can be verbalized. Thus, emphasis is given to traditional behavioral and management concepts. In these programs, the level of rigor associated with quantitative work is generally insufficient to allow broad mathematical applications to particular problems.

There also exist middle-of-the-road programs*** which attempt to achieve a balance between the behavioral and quantitative aspects of problem solving in management and administration. These are also quality programs.

While there have been slight drawbacks associated with each of these three kinds of programs, they are all far superior to most of the graduate programs in management

*e.g., Stanford and University of Pennsylvania.

**e.g., Harvard.

***e.g., Carnegie-Mellon University and Vanderbilt

and administration in the country. Each, in its own fashion, represents at least a partial implementation of a five-part philosophy to which most graduate programs in management and administration pay only token service. Successful management and administrative "problem solvers" must (1) have a good foundation in the basic disciplines (e.g., economics, mathematics, etc.) which are applicable in management and administration; (2) possess a keen understanding of the basic functions (e.g., accounting, marketing, production, etc.) involved in management and administration; (3) be skilled in both the theory and applications to management and administration of the partially mathematical sciences (e.g., statistics, operations research, computer sciences, etc.); (4) be adept at applying the basic aspects of the behavioral sciences (e.g., psychology, anthropology, etc.) to problems

Geological Sciences now span both Earth and Moon. UT-Dallas has received samples of lunar rocks and soils for study, beginning with Apollo 11's flight.

in management and administration; and (5) possess the ability to utilize in innovative and creative ways the above four attributes in a "systems" fashion.

Such is the philosophy of the master's *program* in management and administrative sciences at The University of Texas at Dallas. However, it is proposed that a new route be taken to implementation of the philosophy.

Prerequisites will be set so that an individual entering the *program* not only will be well grounded in mathematics*, computer programming, and the logic of algorithmic processes, but also will possess an ability to read rapidly and comprehend effectively as well as have a good capability in English grammar and composition.

Beginning with these prerequisites, an individual will progress through a *program* which has three basic premises: (1) mathematical and related concepts (both theory and applications) must be emphasized in classroom activities; (2) basic management and administrative concepts and relevant behavioral concepts can be mastered with minimal

*Mathematics including not only differential and integral calculus but also relevant aspects of advanced calculus and even germane topics from difference and differential equations.

classroom exposure, augmented by well-structured integrated reading seminars; and (3) integration of all theory, concepts, and appropriate applications can be achieved in various specializations (e.g., information science, data management, management in education, management and administration, management of financial institutions, management for the delivery of health services, planning of management systems, and management for transportation) through appropriately selected seminars in management systems (which emphasize innovative and creative applications of statistics, operations research, and computer sciences).

The product will be (1) rigorously grounded, (2) application-oriented but theoretically-capable, and (3) motivated toward and capable of "problem solving."

MATHEMATICAL SCIENCES (M.S., M.A.T.)

The need for applied mathematics is constantly growing as other sciences mature; problems which require its use are numerous and pressing, and its practitioners — even its average practitioners — are eagerly employed. It is therefore not surprising that even in institutions with prestigious pure mathematics departments, the number of students of applied mathematics far exceeds that of pure mathematics. The very acceptance of applied mathematics as a respectable discipline in its own right, so natural in Europe, has only recently made headway in America. The result is that even today relatively few applied mathematics departments exist here, and students flock to the good ones.

The Physical Plant Building, near the north extremity of the present campus, designed to be in harmony with educational structures.

It is suggested that, at least for some years to come, the UT Dallas mathematics *program* should concentrate on applied mathematics. The beginning should be a modest Master's *program*. The range of courses offered initially should cover a minimal but basic and respectable field: statistics, computer science, and applied analysis (differential equations, numerical methods, etc.). This could lead to careers in any of these three fields, but it could also lead to work in physics, environmental sciences, management science,

and so on. The aim will be to turn out thoroughly modern applied mathematicians, i.e., those conversant with, and not hostile to, the powerful language and concepts of basic modern pure mathematics.

Another practical rationale for the Master's *program* in the mathematical sciences is the following. Every science student needs years of algebra, calculus, and even more advanced mathematics courses. Also, other students (e.g., social scientists, ecologists) who have heretofore found very little need for mathematics are seeing tremendous increases in the need for quantitive applications in their professional activities.

In view of the above facts, The University of Texas at Dallas does not propose to establish separate graduate programs in applied mathematics, pure mathematics, computer science, and statistics. Rather, it proposes a single *program*, essentially in applied mathematics, with options whereby the student may pursue special interests in applied mathematics, computer science, statistics, or operations research. This is not to say that courses (and eventually perhaps even options) in pure mathematics will not be available, for such options provide essential theoretical training for any mathematician, regardless of his particular goals. The *program* proposed will train the student in the use of the tools of the mathematical sciences to solve problems in the other sciences (physics, biology, chemistry, geology, economics, environmental sciences) and in the management and administrative disciplines.

UT-Dallas is a Participant Member of TAGER (The Association for Graduate Education and Research), which operates closed circuit and broadcast TV facilities connecting several universities and industries. The system also provides on-line use of large computers from remote terminals.